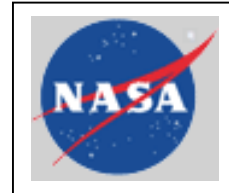


Miniature Sensor Technology Enables A Wide Range Of Commercial Applications



Technology

NASA Glenn, in partnership with Case Western Reserve University (CWRU), developed microfabricated sensor technology that Makel Engineering embeds as the heart of an integrated hydrogen sensing system. GLITeC facilitated interactions between Makel and the NASA Glenn–CWRU team. The team provided advanced fabrication facilities to build the key component of the integrated hydrogen sensing system—the microfabricated sensors.

Commercial Applications



Ensuring the safety of shuttle support staff and crew is NASA's top priority. One key concern is monitoring hydrogen levels during the cryogenic fueling sequence. Today, information is gathered through a complex system of gas sampling hardware. Makel Engineering's improved hydrogen sensing system can simplify the sampling process and improve the quality of potential hydrogen leak detection information. This technology can also be used to detect leaks in a range of launch vehicle applications



Providing a sustainable living environment is a key requirement of the long-term health and safety of space station personnel. Management of in-process hydrogen levels is integral to the performance of the life support system. Makel Engineering's hydrogen sensing system, based on original NASA technology, will monitor hydrogen levels in an O₂ and air background at very specific levels, giving the overall system a clear picture of hydrogen levels present.



The use of fuel cells for power generation is of high interest to NASA as well as to a range of industrial applications. However, ensuring the safety of these fuel cells is an important component of the wide spread application. The Makel/NASA/CWRU hydrogen sensor technology has been chosen to monitor the fuel cells of the NASA Helios vehicle for the presence of hazardous leaks which may damage the power supply or the vehicle.

Social/Economic Benefit

NASA Glenn's collaborative work with Makel Engineering has resulted in the development of the next generation of hydrogen sensor systems. This breakthrough chemical sensing system is lightweight, accurate, and affordable. The technology is made available to NASA and other customers resulting in the following potential benefits:

- Improved safety for Shuttle launches
- Improved life support system performance on board the ISS
- Improved MEMS based sensor fabrication
- Projected Sensor System Sales of over one million dollars

Makel Engineering has strengthened its work force by ten jobs.

NASA Applications

NASA developed the hydrogen sensor to monitor gaseous hydrogen emissions. The system has application in the Shuttle and other Launch Vehicle Fuel Safety Systems, the International Space Station's Life Support Systems, and Advanced Fuel Cell Power Generation Systems.

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